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## Research on Operating Hours in the Netherlands<sup>1</sup>

### 1. The current state of research on operating hours in the Netherlands

Specific research on operating hours is not available in the Netherlands. Data on operating hours are only collected as part of surveys with broader research aims. Moreover, the number of such surveys that include the topic of operating hours is very limited. The published results on plant operating times of these surveys are even more limited.

The only research dealing systematically and more or less continuously with operating hours in the various sectors of economic activity in the Netherlands is carried out by the Institute of Labour Studies ((Organisatie voor Strategisch Arbeidsmarktonderzoek, OSA) in Tilburg. The results of its regular, bi-annual panel of the demand for labour, are published as *Trendrapport Vraag naar Arbeid* ("Trend Report Demand for Labour"). Some results on operating hours and working time patterns are presented in these reports. The most recent results of the OSA panel were collected in 1997 and are reported in Bernasco et al. (1998). The first panel data were collected in 1989 (OSA 1990).

Other recent research projects on operating hours in the Netherlands are limited to specific service industry branches. Research on control over working hours by Tijdens (1998) deals with the relationship between operating hours and working time in banks, public libraries and garages. Related to the retail trade sector there have been two evaluation studies of the 1996 Shop Opening Act (EIM 1997; KPMG 1998).

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<sup>1</sup> Thanks are due to Jean Paul Vosse for providing information on the OSA Labour-demand panel.

For the Netherlands the OSA study shows (see table 1) that between 1995 and 1997 on average working time of full-time employees decreased, while operating hours increased. This also holds for most of the sectors. In part these developments reflect collective agreements on working time reduction and the economic situation, i.e. a trade revival since 1994. However, there are relevant exceptions to this rule. In the transport sector, the care sector and other services the working time of full-time employees increased, and in other services and the government sector operating hours decreased. For the years prior to 1995 only the ratios between operation time and working time (o/w) have been publishes. I will come back on this o/w-ratio in more detail when I deal with the relationship between working time and operating hours. The average working time of full-timers decreases slightly with establishment size. Table 1 also shows that operating hours vary more strongly between sectors and size classes than working hours and that operating hours increase with establishment size. There are considerable sectoral differences in the operating hours. One of the main factors determining the length of the operating times is whether or not several shifts are worked. The average high operation time in the Dutch care sector is linked to the fact that almost all establishments of intramural care are in operation 24 hours per day, although their utilisation rate is considerably lower during the evenings and the nights than during day time. Also the transport sector, including goods transport and public transport, has operating hours that are much longer than those common in other sectors. There is more variance in operating time between sectors than within sectors.

Table 1: **Working time of full-timers per week and operating hours per week in 1995 and 1997 in the Netherlands, by sector and by establishment size class**

	Working time		Operating hours	
	1995	1997	1995	1997
Total	38.3	38.1	54	57
Industry and agriculture	38.3	38.1	52	54
Building	37.9	37.7	43	48
Trade, hotels and repairs	38.5	38.1	55	57
Transport	40.1	40.2	74	77
Commercial services	38.6	37.9	47	51
Care sector	37.7	37.9	99	122
Other services	37.2	38.1	57	56
Government and public utility	38.0	37.0	54	52
Education	38.2	37.9	43	43
5 - 9 employees	38.4	38.1	49	53
10 - 19 employees	38.3	38.2	50	53
20 - 49 employees	38.2	38.1	55	58
50 - 99 employees	38.2	37.9	70	66
100 - 499 employees	38.2	37.9	81	84
500 and over employees	37.9	37.6	106	112

*Source: Bernasco et al., 1998, p. 61*

The evaluation study by KPMG (1998) focused on certain branches of the retail trade: the food sector and certain non-food retail trade including dress shops and do-it-yourself shops. This distinction was made because the motivation of the shop visits in the food sector (routinely daily shopping) and the other branches (recreative character) differs greatly. In the food sector retail trade mainly refers to supermarkets. The average shop opening of supermarkets increased from the legal maximum of 55 hours in the first half of 1996 to 59 hours in 1997 and 66 hours in 1998. Extension mainly refers to evening hours. Food retail stores increased the opening hours from the maximum of 55 hours to 59 hours in 1997. Little use has

been made of Sundays. The non-food sector, like clothing shops and do-it-yourself shops, including the hardware trade and building material trade, make less use of opening during evenings and more use is made of shop opening on Sundays. The EC study of 1994 (EC, 1995, Table 18, p. 129) recorded average weekly opening hours of 51 in the retail trade for the Netherlands.

Systematic research on which factors influence the operating hours is not available. The limited research done shows that in most cases several reasons and considerations play a role in relation to extending operating hours (Tijdens, 1998). These include: better services, better utilisation of capital and reducing overtime and the use of agency work. In trade and services, improvement of services by longer opening hours is an important instrument to compete. Also changes in production technology play a role: shorter terms of delivery, shift from stock to order driven production systems, new maintenance demands, or extension of storage capacity. Dutch trade and industry are confronted with three developments that render longer operating hours necessary (Tijdens, 1998, 27-28): broader shopping hours, just-in-time production and traffic stagnation. Longer operating hours render it necessary to change work patterns and the latter are discussed during negotiations between the social partners. Tijdens (1998) found that the major reason for longer opening hours of public libraries, banks and garages is rendering better services. Banks and garages followed the opening hours of supermarkets. Other shops and the public libraries resemble other firms in the leisure sector.

An upswing, i.e. increasing production, goes hand in hand with the desire to extend operating hours, while productivity increases may reduce this desire. When production increases faster than productivity, extending operating hours will be considered, especially by firms with relative expensive means of production. The trend towards longer operating hours will develop further as long as the economic outlook is positive. Research in 1997 among firms with 50 or more employees shows that 31% of the enterprises expected to extend operating hours towards the

evening and 29% expected extension by means of adding Saturday hours; 24% expected an extension via shift work. An extension of work hours towards the early morning (15%), Sunday (11%) or the night (10%) were taken less into consideration (Tijdens 1998, 54).

## **2. Studies' central aims**

As already mentioned over the past years no specific surveys on operating hours have been carried out. The limited data are only collected by surveys with a much broader aim. The aim of the bi-annual OSA survey on demand for labour (OSA, 1990-1996; Bernasco et al., 1998) in combination with the OSA survey of the labour-supply is to obtain a better insight into the functioning of the Dutch labour market using these data. Five Dutch ministries finance the OSA-research programme: the Ministries of Social Affairs and Employment, Economic Affairs, Health, Education and of Home Affairs.

The study by Tijdens (1998) aims at establishing the relationship between operating hours, working hours and the flexibilisation of personnel input in banks, public libraries, and garages. The central question answered is whether changes in working hours result in changes in the operating hours, or the reverse? In the banking sector the 36-hour working week was introduced, garages stayed open longer in the evening and also wanted to open their workshop on Saturdays, and a number of public libraries opened on Sundays. In this research the mutual connection of five elements of working hours are analysed: the working hours, operating hours, the control of employees over working hours, remuneration of overtime and staffing in the firm.

The aim of the EIM (1997) evaluation study was to establish the impact of the 1996 Shop Opening Act on employment.

The aim of the KPMG (1998) evaluation study of the 1996 Shop Opening Act was to map the changes both inside and outside the retail trade brought about by this new law.

### **3. Concepts of measuring and calculation of operating hours**

In the OSA survey on the demand for labour operating time (*bedrijfstijd*) of an establishment is defined as "the number of hours per week that at least a part of the personnel is at work" (Bernasco et al. 1998, 61). Many establishments, like in the retail trade, have an operating time that is longer than the working hours of full-time employees. Other establishments are continuously operating because of production technical or economic reasons. Examples are hospitals, computer centres, and enterprises in the processing industry. Such establishments have operating hours of 168 hours per week. The OSA definition of operating hours differs considerably from the definition used by the European Commission in 1994 (EC, 1995, Box 2, 27). The duration of operating time is highly related to the kind of the product produced and the production process.

In the OSA survey there is no specific question related to operating hours or opening hours in retail trade firms. The uniform OSA definition applied to all sectors of activity may cause interpretation problems and illustrates the necessity to define the production process and hence operating hours as clearly as possible. Firstly, related to, for instance, the retail trade there is an important difference between operating time and opening time. Operating time is quite often higher than opening hours because of the time needed to replenishing shelves. That is why operating times defined as the number of hours during which an enterprise produces products or delivers services would be more appropriate. Secondly, interpretation problems may result from the unclear OSA definition: for instance, "part of the personnel present" in which both "part" and "personnel" are not clearly

defined. Does the survey question only refer to "production personnel" or also include the maintenance shift or the guarding shifts? Even in hospitals at night the utilisation rate is (much) lower than during daytime. Hence, thirdly, an operational definition of "part" is needed, for instance, a fixed minimum proportion of personnel.

Also the calculation of the operating hours differs considerably from the method applied by the European Commission (EC, 1995). To be able to draw representative conclusions, it is needed to weigh statistical data like percentages and averages from the sample. All establishments within a certain combination of sector of activity and size class (cell) get the same weight in the OSA study. This weight is equal to the inverted fraction in the sample multiplied by the sample fraction of the whole sample. The average weight of the organizations in the sample equals 1. Hence, an establishment proportional weighting is carried out to compensate for disproportional non-responses and to redress the structure of the net sample according to the distribution of establishments in the universe (Bernasco et al. 1998 101). To describe an organisational characteristic, for example operation time, this characteristic is calculated in the OSA-study as follows:

$$\text{Average (weighted) operation time} = K = \frac{\sum_{i=1}^N g_i \cdot k_i}{N}$$

In which  $g_i$  is the weight of firm  $i$ ;  $k_i$  is the operation time in firm  $i$  and  $N$  is the number of firms in that part of the sample on which the conclusion is based. This OSA definition differs considerably from the definition in the EC-study. The latter is strongly influenced by the number of employees in the production process and the number of shifts worked.

To describe characteristics of the organization ore utilization of labour this establishment proportional weighting is inadequate. Now, the size of the establishment has to be discounted in the weighing, i.e. multiplication by an additional



factor is necessary. To describe a characteristic, related to the utilization of labour, for instance working time, the following calculation is used:

$$\text{Average (weighted) working time} = \frac{K = \frac{\sum_{i=1}^N g_i \cdot k_i \cdot o_i}{N}}{N}$$

In which  $g_i$  is the weight of firm  $i$ ;  $k_i$  is the working time in firm  $i$ ;  $O_i$  is the share of organisation  $i$  in total employment within the sample, and  $N$  is the number of firms in that part of the sample on which the conclusion is based.

#### **4. Design of data collection and preparation**

OSA collects its data bi-annually. The first enquiry took place in 1989 (OSA 1990). The last, the fifth survey dates back to 1997. The collected data are panel data, i.e. the respondents have partly stayed the same. By asking the same questions the labour market situation of 1997 is comparable to the one of 1989 (OSA, 1990), 1991 (OSA, 1992), 1993 (OSA 1994) and 1995 (OSA 1996). By questioning the same labour organisation, developments within establishments can be traced.

OSA research on the demand for labour is the result of a stratified sample by sector of activity and class of establishment size among Dutch private and public organisations with five or more employees. The unit of enquiry is the establishment. Related to small firms, the establishment coincides in most cases with the firm as a whole. In general this is not the case for large firms. Related to the latter only one establishment - the primary one - is selected. To ensure that enough large primary establishments are part of the survey, the sample has been structured with respect to sector and size. Thus, large primary establishments and small sectors are oversampled. This stratification is necessary to be able to draw

representative conclusions for Dutch establishments with five or more employees on a basis of a sufficient number of observations within specific sectors and size classes. In case of an unstratified sample the larger 500+ establishments as well as the number of governmental organisations, care and transport organisations would have been underrepresented in the sample.

The total population is about 125,000 primary establishments. The sample consists of over 2,500 primary establishments, about 20% of all establishments. In 1997 the response rate was 63.1%. In previous years the response rates were 68-69%. An important part of this drop had to do with the reduction of the sample size from over 2,700 to over 2,500 at the expense of the government sector, characterised by very low non-response rates. When this is taken into account, the 1997 response was only slightly lower than in previous years. Although the response still is reasonable, it is important to mention that firms consider a participation of four times in the bi-annual labour-demand panel is "sufficient".

The OSA-survey is a combination of face-to-face interviews and written data collection. Firstly, the interviews concern the collection of data on general matters and some specific financial data. These interviews were found necessary to realise sufficient respondents. Secondly, the written questionnaires mainly contain quantitative questions. The written questionnaire was found necessary because many questions require internal research by the respondents. The written questionnaire is left behind after the interview in order to be filled out by clerical staff or the personnel department. Finally, the completed forms are personally collected at the firms. This resulted in a higher response rate. Compared to the past response rate of 80%, in 1997 85% of the establishments returned the questionnaire.

For the first three waves, the population for the panel was limited to organizations with at least 10 employees. Now, the OSA research on demand for labour uses is a sample of "all labour organizations in the Netherlands with at least

5 employees". Moreover, all larger firms were asked to cooperate. To collect the information at the level of individual establishments several registers were used, including the register of the Chamber of Commerce for private establishments, the pension fund for civil servants (ABP) for care providers, the CASO school register of the Ministry of Education, the "State almanac" for central and local government organizations, and directories of hospitals, homes for the elderly, etc.

## **5. Recent changes in the regulation of shop opening hours and working time regulations**

International differences in both the number of operating hours and the flexibility and variation of working time patterns are related to differences in regulations. The developments in working time patterns and weekly operating hours are closely linked to changes in these regulations. Until recently (1996) the Netherlands had relatively strict regulations related to working time and shop opening hours.

### *5.1 The Shop Opening Hours Act*

A striking result of the 1994 comparative study on operating hours in the EU-Member States (EC, 1995, Table 18, 129) was that the variance of the average opening hours per week in retail trade in the Netherlands (as well as in Germany) was much lower than in other countries with more liberalized regimes (Belgium and the United Kingdom). Half of the Dutch shops had opening hours of 51 to 55 hours per week. Hence, the weekly opening hours were close to the legal maximum (see table 2), indicating that the legal directives were oppressive. That is why the Central Planning Bureau (CPB, 1995, 4) expected that the more liberalized law could increase average opening hours of shops by 4 to 6 hours per week. The relatively

low average opening hours in France, Italy and Spain is shown to somehow correlate to the density of population.

Table 2: **Changes in regulation of shop opening hours in the Netherlands**

	<b>Shop Closing Act 1976</b>	<b>Shop Opening Act 1996</b>
Maximum opening hours	55 hours per week	no maximum
Opening hours on working days	from 6.00 to 18.30 maximum 1 evening per week	from 6.00 to 22.00
Opening hours on Saturday	from 6.00 to 18.00	from 6.00 to 22.00
Maximum number of Sunday	8	12

As of June 1st, 1996, legislation of Dutch shop opening hours has been liberalized (see table 2). Maximum opening hours have been extended considerably. Shops are allowed to be open between 06.00 and 22.00 from Monday to Saturday. Local governments can permit shops to open on Sundays for a maximum of 12 Sundays per year. The former allowed opening hours were Monday through Wednesday 06.00-18.30; Thursday and Friday 06.00-21.00; Saturday 06.00-18.00; and up to 8 Sundays a year.

## *5.2 The Working Hours Act*

On January 1st, 1996, the Working Hours Act replaced the Labour Act, which dates back to 1919 (see table 3). The Working Hours Act, in line with an EC Directive on the Organization of Working Time, maintains the idea of statutory regulation of certain maxima and minima as regards working day, working week, daily rest, weekly rest, overtime, etc. Wider flexibility of working hours is only useful if it is not made compulsory and general, but is agreed pragmatically

between the social partners at the company level (EC 1995, 10). The flexibility of the Working Hours Act is most noticeable on this point. It avoids giving hard maxima and minima-rules. The Act offers a wide range. It lays down a certain level of maxima and minima, which must be respected in enterprises in which there is no waiver agreement between employer and workers' representatives in force. If a waiver agreement is in force, the maxima and minima may be higher/lower up to an ultimate level, that is also laid down in the Working Hours Act. Waiver agreements cannot go beyond this ultimate level. If there is a necessity to go beyond this ultimate level the Labour Inspectorate can give special permits. For example: the maximum working day, laid down in the Working Hours Act, is now 9 hours. Yet, in a waiver agreement parties can push this level up to a maximum 10 hours. If a further extension is desired this is only possible on the basis of a permit from the Labour Inspectorate.

Table 3: **Working time regulations in the Netherlands**

	<b>Labour Act 1919</b>	<b>Working Hours Act 1996</b>	
		<b>Standard</b>	<b>With agreement</b>
Maximum number of average hours per day (per week)	8.5 (48)	8 (40)	9 (45)
Maximum number of working hours per day (per week)	9.5 <sup>a</sup>	9 (45) <sup>b</sup>	10 <sup>c</sup>
Maximum compensation period	4 weeks	13 weeks	13 weeks
Minimal number of resting hours after work day (week)	no regulation	11 (36)	11 (36)
Minimal number of holiday days (of a full-time worker)		20	20
Work at irregular hours: Sundays	prohibited <sup>f</sup>	restricted <sup>d</sup>	restricted <sup>e</sup>
Work at irregular hours: nights	No specific provision	restricted <sup>g</sup>	restricted <sup>g</sup>

<sup>a</sup> Up to 11 hours in case of incidental overtime (a maximum of 62 hours including incidental overtime applies).

<sup>b</sup> Up to 11 hours in case of incidental overtime (a maximum of 45 hours per week over a period of 13 weeks including incidental overtime applies).

<sup>c</sup> Up to 12 hours in case of incidental overtime (a maximum of 48 hours per week including incidental overtime over a period of 13 weeks applies).

<sup>d</sup> Allowed for special reasons only, with a minimum of 4 free Sundays per 13 weeks.

<sup>e</sup> Allowed for special reasons only, with a minimum of 13 free Sundays per year.

<sup>f</sup> Exemptions granted by Ministry of Social Affairs and Employment.

<sup>g</sup> Restrictions relate to a minimum rest period, a maximum duration and number of night shifts.

*Source: Delsen and Jacobs, 1999.*

In the new situation average working time is restricted to 40 hours per week or 520 hours per 13 weeks, and a maximum to 9 hours per day and 45 hours per week. So, the maximum per day has been increased by half an hour and the maximum per

week has been decreased by 3 hours. Sectoral or company agreements can be up to a maximum of 10 working hours per day, maximum 200 hours per 4 weeks or maximum 585 hours per quarter of a year. The compulsory resting time is 11 hours a day.

One of the main pressures behind the changes is the perceived need for greater flexibility, both in terms of allowing companies to tailor working time to their own individual needs, and in terms of increasing company operating time, including work at weekends. Greater flexibility will also, it is argued, help create employment. The new legislation responds to these pressures by providing for new, generally less restrictive, limits on weekly and daily hours, rest periods, breaks, overtime, night and weekend work. For example, Sunday working was subject to a general prohibition under the old regime (except where exemptions were granted). Under the new system, while Sunday is still not a normal working day, work is possible if the company's situation demands it.

## **6. Relationship between capital operating hours and working hours**

Now I will address some theoretical and empirical aspects of the relationship between operating hours and working time patterns. Working time is important in relation to the operating hours. When operating time and working time are equal, the employer can limit himself to hiring/firing full-time workers to run his organization properly. However, especially since 1993, there has been a diverging trend in the Netherlands related to the ratio operating time to working time (o/w) (see table 4) mainly due to the trade revival. The 1997 data refer to establishment with 5 or more employees. Earlier ratios refer to establishment with 10 or more employees. An operating time below the standard working time per week hardly exists, except in education. Here a relevant difference can be made between giving lessons and other school duties done by teachers when the school door has been locked. The

Table 4. **Ratio between operating hours and full-time working time (o/w) in the Netherlands, 1989-1997**

	o/w<1	1<o/w<1.25	o/w>1.25
1989	45	35	20
1991	40	37	23
1993	30	43	27
1995	24	37	39
1997	22	36	42

*Source: OSA, 1990-1998.*

OSA labour-demand survey does not make this distinction. The answers between respondents may differ because of this difference in interpretation. Table 4 shows that in an increasing number of establishments the operating hours exceed the weekly full-time working hours. The proportion of establishment with an o/w-ratio of 1 or lower dropped from 45 to 22%. Notably establishment with favourable expectations of sales caused this shift (OSA, 1994, 65). On the other hand, the proportion of establishment with an o/w-ratio equal to or over 1.25 increased from 20 to 41% between 1989 and 1997. In 1991 establishment were asked why the operating hours were longer than the standard working week. Over half of the organisations mentioned "rendering services to public or consumers" as being the most important reason. Production technical necessity was the most important reason for 18% of the organisations in industry and 9% of the organisations in the non-profit sector (OSA, 1992, 55). The divergence between working hours and operating hours increases the demands on the logistic and organisational procedures. For instance, more rosters and time tables are needed; part-time jobs are introduced or extended; also more time is needed to transfer duties and employees are expected to work on irregular days and times, for instance working on Saturday and/or Sunday, working minishifts, a compressed working week or shift work. So, the o/w-ratio indicates the extent to which such organizational and logistic procedures are needed.



The increase in the o/w-ratio also applies to almost all sectors of activity. Because the variance in operating time is much larger than in working time (see table 1) the o/w-ratios reflect more or less the differences in operating hours. Consequently the ratio is the highest in the care sector, the trade, hotels and catering branch and the repair sector. Larger organisations on average have longer operating hours and shorter working hours than smaller firms.

Longer operating times and a sharp expansion of the service sector require working hours to be made more flexible. The OSA Labour-demand panel also collects data on various forms of internal flexibility, including overtime, part-time work, flexible work weeks, flexible yearly contracts, working on Saturday and/or Sunday, minishifts, compressed working week and shiftwork, and on external flexibility, including work on call, fixed-term jobs and agency work. Freelance work, posting, min-max contracts are not included in the dataset. Data on internal and external flexibility by sector of activity and by establishment size are published in a limited number of tables. However, these flexible work patterns and work rosters are not explicitly linked to the research results on operating hours. No regression analysis is carried out.

Certain working time patterns are crucial for the functioning of the organisation. These patterns are more or less permanent, although they may result in discomfort for employees. They include compressed working week, working regularly on Saturday and Sundays, minishift and shiftwork. Working two or more shifts is considered an important option to adapt the use of personnel to long operating hours, to reduce unit capital costs and hence unit costs. For continuous industries and services it even is the only option available. This explains the high frequency of shiftwork in the Dutch care sector, industry and agriculture and the transport sector. Working shifts require a minimum number of employees. This explains why the OSA study also found that shiftwork is more frequent in larger establishments (Bernasco et al., 1998). Tijdens (1998) concludes that the desire to extend operating

hours and to make working hours more flexible is almost always preceded by a period of working much overtime.

Flexible work options are mainly used to react and adapt to certain temporary fluctuations in activity. These flexible work options include fixed-term contracts, agency work, on call work, overtime, flexible working weeks and flexible yearly contracts. In my view part-time employment plays an intermediate position between these forms of flexible labour. In the Netherlands - even more than in other countries - the development in part-time work is supply-driven. Unlike in other EU-countries, in the Netherlands also related to the growth of temporary jobs the supply side plays an important role (Delsen, 1995). Part-timers may be brought in at (predictable) peak times and to cover regular and anticipated variations in demand, thereby avoiding underemployment of full-time staff during off-peak periods, or costly and exhausting overtime in busy periods and enable establishments to remain open longer, for instance on evenings or weekends. The organisation may also be able to meet fluctuations in the demand without hiring temporary employees who may be unfamiliar with the job. The proportion of part-time employment (36%) in the Netherlands is the highest in the OECD. The proportion of flexible employment (fixed-term contracts, on call contracts and agency workers) is over 12%, one of the highest proportions in the EU (Delsen 1999). The latest survey on working conditions by the Dublin Foundation (Paoli 1997) shows that related to working shifts, nightwork, working Saturdays or Sundays, overtime and working at home the figures for the Netherlands are clearly below the EU-average. Also short-time work is low in the Netherlands (Delsen/Jacobs 1999).

Immediately after the introduction of the Shop Opening Act in 1996, supermarkets extended their opening hours. This necessitated changes in rostering and working hours. That is why employers put two subjects on the collective bargaining agenda: (1) full-timers should also have to work in the evening and on Saturdays and (2) there should be a reduction of allowances for working on non-

regular hours. The supermarkets were followed by other consumer-oriented sectors, like evening opening hours of municipalities, do-it-yourself centres, banks, garages, courts, and consulting-hours of family doctors. The central aim is the improvement of the services offered to clients. As a result new work rosters as well as new working hours are needed, and allowances for working outside the regular hours are brought up for discussion (Tijdens 1998, 27-28).

During the 1990, overtime has been increasingly worked in the Dutch industry, especially on Saturdays. Due to shorter terms of delivery, industrial firms have to concentrate production on the desired moments (just-in-time production), implying that firms are confronted with more variation in busy and slack times, maintenance outside the production time, and a more optimal use of the capital goods is becoming more necessary. These developments express the shift from product towards order driven production systems. Flexible working hours of the personnel (the insiders) is desired and so a range of working times replaces the fixed number of hours. When working outside the regular hours is necessary, this results, like in the supermarkets, in a reduction of the allowances for non-regular hours (Tijdens 1998, 28). Transport hours are changed to go around traffic queues and to shift towards the early morning, the evening and the weekend. This not only concerns the supply of shops, but also the road building and maintenance of railroads. According to Tijdens (1998, 28) also in these sectors the desired flexibilization can no more be provided by agency and on-call labour. Employers want such flexible working hours and lower allowances to be included in collective agreements.

The two evaluation studies of the Shop Opening Act of 1996 (KPMG 1998; EIM 1997) show that in the supermarkets employment (work years) increased by 5% and the average opening hours increased by 15-20%. The number of persons employed increased by 7,000 and the average number of hours worked increased by 60,000: the new employees worked 8.5 hours per week on average. For the building markets employment (in man-years) increased by 7%, and average opening hours increased by 15-20%. About 1,000 additional

employees were employed and the number of hours worked per week increased by 12,750: i.e. new employees worked on average 12.75 hours per week, compared to the average work week prior to the Shop Opening Act. The additional employment due to the new Shop Opening Act mainly consisted of part-time jobs and on-call labour. The proportion of full-time employees dropped both with non-users and users. However, total employment increased in the user shops and dropped in the non-user shops. Another relevant conclusion was that mainly those shops that already had a high proportion of part-time and on-call labour, used the new Act (KPMG, 1998, 68-69). Note, however, that these results are also strongly influenced by the business cycle situation.

In theory longer shop opening hours may result in an increase in the total retail sales, in a substitution within the retail trade sector and substitution with other sectors. Dutch research evaluating the 1996 Shop Opening Hours Act shows that sales did hardly increase. There is some substitution at the expense of other sectors and sales in the medium and large shops grew at the expense of small shops (see CPB, 1995; KPMG 1998). It is often suggested that longer shop opening hours will result in an increase in work pressure. Related to the retail trade two aspects are of importance: the sales per hour worked (indicating the number of customers) and the distribution of the sales over the day (indicating peak loads). Research points out that the work pressure dropped due to longer opening hours as a result of the new act. Also the peak load dropped because of a better spread of the sales over parts of the day (KPMG, 1998, pp. 70-73). From this it may be concluded that there is no hard evidence for the positive relationship between opening hours and unit costs. In fact, the relationship may even be negative. Finally, the KPMG 1998 study also shows a significant positive correlation between the extension of shop opening hours in the retail trade and the degree of urbanization: there was a tendency towards longer shop opening hours in highly urbanized areas.

## 7. Conclusions

For the manufacturing industries the main motive to lengthen the operating time is a better utilisation of capital. For the service sector the improvement of services is the main consideration. In collective bargaining longer operating hours are traded against shorter, but more flexible working hours. There is a positive relationship between opening hours and urbanization/population density. Another conclusion that can be drawn from the Dutch survey data in relation to generating representative and comparable data on operating times it is important to note that operating hours very much depend on the industry and branch structures as well as firm size. Also the business cycle situation is of importance. Comparable data need to be corrected for these differences. The remaining differences can then be explained from differences in management style and from differences in regulations on shop opening hours and on working time and other institutional differences. Policy recommendations can be based on these differences.

Operating hours need to be defined as clearly as possible in order to avoid subjectivity in the answers given and hence interpretation problems. For the sake of comparability a measure is to be preferred that combines opening hours/operating hours and labour intensity, i.e. a definition that is very closely linked to the productive capacity and the production process. The collected data should allow constructing such a measure. For instance, operating times could be defined as the number of hours during which an enterprise produces products or delivers services, and combined with a minimum proportion of staffing. Information on the production cycle may also be of importance. An alternative to or an addition to the present standard definition of sectors of activity could be to collect data on the largest occupational group of employees employed. This fits the convergence of the production process between the service sector and the industrial sector, e.g. because of just-in-time production.

To collect reliable and detailed data and to realise a sufficient response the Dutch experience shows that a combination of face-to-face interviews and written data collection is appropriate. Regular panel data collection, for instance every two years, makes data comparable in time and offers the opportunity to trace developments in operating time and in working time patterns within the same labour organisation.

Especially the permanent working time patterns, including shift work, working regularly on Saturday and Sundays, minishifts and compressed working weeks, are crucial, i.e. conditions *sine qua non*, to extend operating times. Flexible labour contracts, including on call, agency work and fixed-term contracts are mainly consequences of longer operating hours. They offer the opportunity to shift uncertainty towards employees and to reduce fixed labour costs. Part-time employment plays an intermediate role and is - certainly in the Netherlands - mainly supply-side dominated.

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